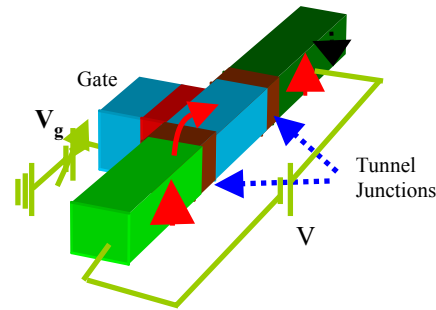


Spin Transport and Dynamics in Nanoscale Hybrid Structures

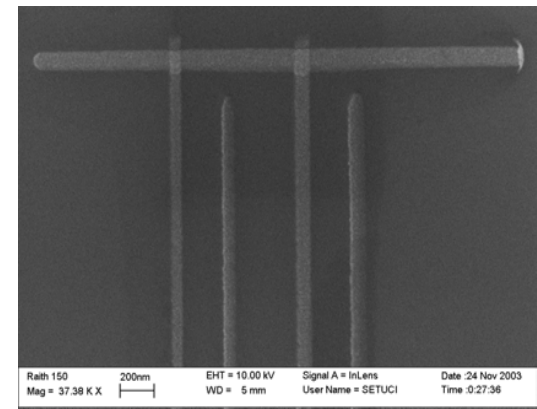
Recent developments in spin tunnel junctions and single electron transistors are combined to fabricate and characterize nanoscale hybrid junction structures that reveal new physical aspects of quantum states and dynamic behavior of single electron spins.

Single electron transistor (SET) consists of a small metallic island weakly coupled to two electrodes through tunnel junctions. An FMSET uses ferromagnetic materials as electrodes. To accumulate spin polarized electrons on the non-ferromagnetic island, the magnetizations of the two FM leads need to be in antiparallel configuration. This can be achieved by using different FM materials or by varying the width of the electrodes, consequently, yielding different coercivities for the two electrodes.



Schematic diagram of a FMSET

- Ferromagnetic Lead I
- Ferromagnetic Lead II
- Normal metal / Super Conductor



SEM image of a fabricated FMSET.

J. Philip, et al. J. Mag. & Mag. Mat. 272-276, 1949 (2004)

PI: J. G. Liu; UC Irvine
Work performed at SNF